

**Patent**  
**10/099,891**

### REMARKS

Claims 1-50 are pending in this application. Claims 1, 30, 35, 36 and 40 are independent claims.

Applicants thank the Examiner for the indication that Claims 16-17, 19-29 and 40 were indicated to contain allowable subject matter.

The drawings were objected to in paragraphs 1 and 2 of the Action on the grounds that the "numbers and letters of FIGS 1-6 are no legible" and FIG 7 was "objected to because there are no descriptive legends for the boxes". Formal drawings are submitted herewith. These drawings provide legible numbers and letters. A marked-up copy of FIG 3 including an illustration of shutter 380, and of FIG 7 including descriptive legends for the boxes, are also provided herewith. Withdrawal of the objections to the drawings is respectfully requested.

Claim 12 was rejected under 35 USC 112, first paragraph, as failing to comply with the enablement requirement. Specifically, "Claim 12 recites the limitation 'wherein at least one of the optical elements includes a shutter for attenuating the selected channel wavelength directed by the optical element, and wherein said configuration of the optical elements adjusted by the controller includes a position of the shutter within a path traversed by the selected channel wavelength'. Applicants submit that this recitation is supported at least at paragraph [0042]. Based on Applicants' specification, one of ordinary skill in the art would be enabled to make and/or use the invention. As requested in the Action, FIG 3 has been amended to include an illustration of this feature as element 380.

Claims 38-39 were also rejected under 35 USC 112, first paragraph, as failing to comply with the enablement requirement. Specifically the limitation "a monitoring arrangement for determining a power level of a first channel wavelength at the input port of the optical amplifier relative to a power level of the first channel wavelength at the output port of the dynamic gain adjuster" is allegedly not described in the specification in such a way as to enable one skilled in the art to make and/or use the invention.

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Applicants submit that this recitation is supported at least at paragraph [0036] and that one skilled in the art would be enabled to make and/or use the invention of Claims 38-39 based on Applicants' disclosure as filed.

Reconsideration and withdrawal of the Section 112, first and second paragraph rejections are respectfully requested.

103(a) rejections

Claims 1, 10, 13, 15, 18, 40, 46 and 48-50 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,501,877 (Weverka) in view of Chu (K.Chu et al., "Scalable Optical -Path Supervisory Scheme Using Pilot Tones and Channel Equalizers", Electronics Letter, Vol. 36, No. 9, 27<sup>th</sup> April 2000) and US Patent 6,256,430 B1 (Jin).

Claims 1-11, 13-15, 18, 30-34, 36-37, 40-46 and 48-50 were also rejected as being unpatentable over U.S. Patent 6,094,296 (Kosaka) in view of Weverka and Jin.

Finally, independent Claim 35 was rejected as being unpatentable over Kosaka in view of Weverka, Jin and US Patent 6,721,509 (Xiao et al.).

Each of the rejections is respectfully traversed in light of the following discussion, and reconsideration is requested.

Independent Claim 1 is directed to an optical switch including at least one input port for receiving a plurality of channel wavelengths of an optical signal, a plurality of output ports, a plurality of wavelength selective elements that each select a channel wavelength from among the plurality of channel wavelengths received at the at least one input port, a plurality of optical elements respectively associated with the plurality of wavelength selective elements, each of the optical elements directing one of the selected channel wavelengths selected by the associated wavelength selective element to any one of the output ports independently of all other channel wavelengths and with a selectively variable degree of attenuation, and a controller for adjusting a configuration of the optical elements to provide the channel wavelengths with the selectively variable degree of attenuation.

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As recited in Claim 1, each of the optical elements:

(1) directs one of the selected channel wavelengths selected by the associated wavelength selective element to any one of the output ports independently of all other channel wavelengths, and

(2) with a selectively variable degree of attenuation.

Independent Claims 30, 35 and 36 also include this recited limitation.

Independent Claim 40 is directed to a method for directing at least first and second wavelength components of a WDM signal that includes a plurality of wavelength components from an input port to selected ones of a plurality of output ports. The method includes the steps of demultiplexing the first wavelength component from the WDM signal and (1) directing the first wavelength component to a given output port, (2) while selectively attenuating the first wavelength component.

Paragraph 7 of the Office Action relies upon Weverka as a primary reference, but acknowledges that “Weverka does not teach a variable attenuation”. The Action then relies upon the alleged teachings of Chu, taking the position that Chu “discloses in FIG. 1 an optical crossconnect comprising an OXC controller and a plurality of channel equalizers (CE)” and that it “would have been obvious....to equalize power levels of wavelength channels as taught by Chu et al., in the wavelength router of Weverka et al. because unequal power of different wavelength channels cause undesirable non-linear effects and a maximum transmission distance of WDM signal is limited by the wavelength channel having the lowest power”.

The Action then acknowledges that the “combination of Weverka et al. and Chu et al. still fails to teach that the plurality of mirrors provide variable attenuation”. The Action then relies upon the alleged teachings of Jin et al., taking the position that “Jin teaches that variable attenuation can be introduced by intentional misalignment of light”, and that it “would have been obvious...to adjust attenuation by intentional misalignment of the mirrors, as taught by Jin et al., in the modified wavelength router of Weverka et al. and Chu et al. because using misalignment of mirrors for adjust attenuation eliminates external variable attenuators and, therefore, reduces system cost and increases system reliability”.

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First, Applicants submit that none of the cited references, i.e., Weverka, Chu or Jin, teaches or even suggests an optical switch or dynamic gain adjuster, that includes optical elements, wherein optical elements (1) direct one of the selected channel wavelengths selected by the associated wavelength selective element to any one of the output ports independently of all other channel wavelengths, *and* (2) with a selectively variable degree of attenuation.

The Office Action does not even provide any indication as to where such a teaching may be found, either individually in the cited art, or in the combined references. Rather, the Action simply relies upon Chu for illustrating an 'optical crossconnect comprising...a plurality of channel equalizers', and upon Jin for illustrating that 'variable attenuation can be introduced by intentional misalignment of light'.

Even *if* the individual references taught the specific technology alleged in the Action to be taught therein, the references simply do not teach or suggest that optical elements (1) *direct one of the selected channel wavelengths* selected by the associated wavelength selective element *to any one of the output ports independently of all other channel wavelengths*, *and* (2) with a *selectively variable degree of attenuation*.

For at least the foregoing reason, Applicants respectfully submit that each of independent Claims 1, 30, 35, 36 and 40 is patentable over the combined teachings of Weverka, Chu and Jin.

The rejection based on the alleged teachings of Kosaka, Weverka and Jin also fails to address the specific limitation noted above. The Action states that Kosaka discloses an optical amplifier, but "does not teach an optical switch for adjusting attenuation". The Action then turns to the teachings noted above as alleged to be shown in Weverka and Jin, and concludes that it would have been obvious to "use a wavelength router with adjustable misalignment for gain adjustment, as taught by Weverka and Jin, in the optical amplifier of Kosaka, because the combination replaces the demultiplexer, gain adjusters, multiplexer, and, therefore, reduces the number of components and increases system reliability".

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Again Applicants respectfully submit that Kosaka, Weverka and Jin, separately or in combination, absolutely fail to teach or even to suggest an optical switch or dynamic gain adjuster, that includes optical elements, wherein the optical elements (1) direct one of the selected channel wavelengths selected by the associated wavelength selective element to any one of the output ports independently of all other channel wavelengths, and (2) with a selectively variable degree of attenuation.

In addition, Applicants respectfully submit that it would not be "obvious to one of ordinary skill in the art" to combine the alleged teachings of Weverka, Chu and Jin, or Kosaka, Weverka and Jin, in the manner suggested. Again, the analysis presented in the Action simply relies upon Applicants' *own specification* as an 'instruction manual' to pick and choose elements from several references in order to "build" an obviousness rejection, which of course is improper.

In addition, the Action fails to provide a sufficient indication of the requisite motivation, suggestion or teaching, *in the prior art*, to support a *prima facie* case of obviousness. Rather, the Action relies upon impermissible hindsight based on Applicants' teachings, to piece together the alleged teachings of the references.

For all of the foregoing reasons, each of independent Claims 1, 30, 35, 36 and 40 is believed patentable over the art of record.

Dependent Claims 2-29, 31-34, 37-39 and 41-50 are believed to be clearly patentable for all of the reasons indicated above with respect to Claims 1, 30, 35, 36 and 40, one or another from which they depend, and even further define over the art of record by reciting additional distinguishing limitations.

Since the Applicants have fully responded to the rejections set out in the Office Action, it is respectfully submitted that in regard to the above remarks that the pending application is in condition for allowance and prompt review and issuance is accordingly requested. Should the Examiner be of the view that an interview would expedite consideration of this Amendment or of the application at large, request is made that the

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Examiner telephone the Applicants' undersigned attorney at (908) 518-7700 in order that any outstanding issues be resolved.

Respectfully submitted,

4/5/06  
Date

  
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